SECTION 09 90 00

INTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Field applied paints and coatings.

1.2 RELATED SECTIONS

A. Section 06 40 00 - Architectural Woodwork.

B. Section 08 11 00 - Hollow Metal Doors and Frames.

C. Shop primed products specified in other sections.

1.3 REFERENCES

A. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

B. ASTM D2016 - Test Method for Moisture Content of Wood.

C. CBC - California Building Code, 2001 edition.

1.4 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.5 SUBMITTALS

A. Product Data: Submit complete list of materials in form of paint systems scheduled listing specific product intended for each coat. In addition, submit manufacturer's data for each product to be used identified by manufacturer's name and product label or stock number.

B. Samples: Submit samples, minimum 8-1/2 x 11 inches in size, illustrating finishes and colors to be used. Identify each sample with color name, color number, finish name, and formula.

C. Manufacturer's Application Instructions: Indicate preparation and application requirements and procedures.

1.6 QUALIFICATIONS

A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with minimum 5 years documented experience.

B. Applicator: Company specializing in commercial painting and finishing with minimum 5 years documented experience and approved by product manufacturer.

1.7 REGULATORY REQUIREMENTS

A. Conform to CBC Section 804 for combustibility requirements for finish materials.

B. Conform to regulations of local air quality management district and California Air Resources Board regarding use of architectural coatings (paint).

1.8 FIELD SAMPLES

A. Provide field-test panels testing adhesion of specified finish costs to shop primers. Provide one sample, minimum 24 x 24 inches in size for each type of primed surface to be painted or finished.

1. Apply finish coat to shop primed substrate and allow to dry in accordance with manufacturer's application instructions.

2. Cut "X" minimum 12 x 12 inches through finish coat; cover with 2 inch wide thoroughly adhered masking tape.

3. After minimum 48 hours, remove tape; if finish coat remains totally adhered, proceed with specified system. If primer fails, notify Architect.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site, store, handle and protect in accordance with manufacturer's instructions and recommendations.

B. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.

C. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.

D. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F in well ventilated area, unless required otherwise by manufacturer's instructions.

E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.

B. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors unless required otherwise by manufacturer's instructions.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.11 EXTRA MATERIALS

A. Deliver 5-gallon container of each type of paint in each color and each sheen used to Owner.

B. Label each container with color, sheen, and room locations, in addition to the manufacturer's label.

C. Deliver to Owner; obtain receipt.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. The Sherwin Williams Company.

B. Manufacturers Offering Equal Products:

1. Dunn-Edwards Corporation.

2. Frazee Industries, Incorporated.

3. ICI Dulux Paints.

C. Substitutions: Under provisions of Section 01 60 00.

2.2 COMPONENTS

A. Coatings: Ready mixed except for field catalyzed coatings. Prepare coatings:

1. To soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.

2. For good flow and brushing properties.

3. Capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, turpentine, paint thinners, shellacs and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

C. Patching Material: Latex filler.

D. Fastener Head Cover Material: Latex filler.

2.3 FINISHES

A. Refer to schedule at end of section for surface finish schedule.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Gypsum Wallboard: 12 percent.

D. Do not begin installation until unsatisfactory conditions have been corrected. Application of prime coat will be considered acceptance of receiving surface.

3.2 PREPARATION OF SURFACES FOR PAINTING

A. Prepare surfaces in accordance with paint manufacturer's instructions and recommendations.

B. Remove electrical raceways and plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.

C. Correct minor defects and clean surfaces which affect work of this section.

D. Seal marks which may bleed through surface finishes.

E. Impervious Surfaces: Remove mildew by scrubbing with solution of trisodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Gypsum Board Surfaces: Latex fill minor defects. Spot prime defects after repair.

G. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing; clean by washing with

solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

H. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime metal items including shop primed items.

3.3 PROTECTION

A. Protect elements surrounding the work of this section from damage or disfiguration.

B. Repair damage to other surfaces caused by work of this section.

C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.

D. Remove empty paint containers from site.

3.4 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Spray apply paint to metal access doors and access panels.

C. Back roll paint spray applied to gypsum board surfaces.

D. Apply material evenly, free from sags, runs, crawls, holidays, brush marks, lap marks, defects and blemishes. Cut sharply to lines.

E. Do not apply finishes to surfaces that are not dry.

F. Apply each coat to uniform mil thickness recommended by manufacturer.

G. Apply each coat of paint slightly darker than preceding coat unless otherwise authorized by Architect.

H. Sand lightly between coats to achieve required finish.

I. Allow applied coat to dry before next coat is applied.

J. Paint every exposed interior surface within Interiors Improvement project area, except as specified or noted otherwise, whether or not paint is scheduled and colors are designated.

1. Do not paint plated, prefinished or shop finished surfaces unless painting is specified, scheduled, or noted.

2. Paint hot dipped galvanized and electrolytic zinc coated surfaces.

K. Replace identification markings on mechanical or electrical equipment when painted accidentally.

L. Reinstall electrical plates and raceways, hardware, light fixture trim, and fittings removed prior to finishing.

3.5 CLEANING

A. As work proceeds, promptly remove paint where spilled, splashed, spattered or oversprayed.

B. Repair surfaces damaged by spilled, splashed, spattered or oversprayed paint. Replace surfaces that cannot be repaired to satisfaction of the Architect and Owner.

C. During progress of work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.

D. Collect cotton waste, cloths, and material that may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.6 PAINTING AND FINISHING SCHEDULE - INTERIOR SURFACES

A. Gypsum Board:

1. Satin Sheen: Eggshell Latex Enamel; Latex Primer

1st coat	B28W200 PrepRite Latex Primer
2nd coat	B20W251 ProMar 200 Eg-Shel Enamel
3rd coat	B20W251 ProMar 200 Eg-Shel Enamel

2. Semi-Gloss Sheen: Semi-Gloss Latex Enamel; Latex Primer

1st coat	B28W100 PrepRite Latex Primer
2nd coat	B31W251 ProMar 200 Semi-Gloss Enamel
3rd coat	B31W251 ProMar 200 Semi-Gloss Enamel

B. Uncoated Ferrous Metals:

1. Satin Sheen: Eggshell Latex Enamel; Latex Primer

1st coat	B66W310 Pro-Cryl Universal Primer
2nd coat	B20W251 ProMar 200 Eg-Shel Enamel
3rd coat	B20W251 ProMar 200 Eg-Shel Enamel

2. Semi-Gloss Sheen: Semi-Gloss Latex Enamel; Latex Primer

1st coat	B66W310 Pro-Cryl Universal Primer
2nd coat	B31W251 ProMar 200 Semi-Gloss Enamel
3rd coat	B31W251 ProMar 200 Semi-Gloss Enamel

C. Shop Primed Ferrous Metals:

1. Satin Sheen: Eggshell Latex Enamel; Latex Primer

Touch-up	B66W310 Pro-Cryl Universal Primer
1st coat	B66W310 Pro-Cryl Universal Primer
2nd coat	B20W251 ProMar 200 Eg-Shel Enamel
3rd coat	B20W251 ProMar 200 Eg-Shel Enamel

2. Semi-Gloss Sheen: Semi-Gloss Latex Enamel; Latex Primer

Touch-up	B66W310 Pro-Cryl Universal Primer
1st coat	B66W310 Pro-Cryl Universal Primer
2nd coat	B31W251 ProMar 200 Semi-Gloss Enamel
3rd coat	B31W251 ProMar 200 Semi-Gloss Enamel

3.7 SCHEDULE OF COLORS AND SHEENS

A. Color number designations on Drawings identify colors, indicate number of paint colors on project and location of those colors.

B. Sheens:

1. Gypsum Board:

a. Walls and Ceilings of Other Rooms: Flat.

2. Other Materials: To match sheen of adjacent gypsum board finish.

END OF SECTION

SECTION 10 14 19

SIGNAGE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Sign and graphic elements for interior construction.

B. Related Sections: Section 05 50 00 - Metal Fabrications, and Section 09 29 00 - Gypsum Board Systems.

1.2 REFERENCES

A. AISC, Manual of Steel Construction.

B. AWS D1.2, Structural Welding Code - Aluminum.

C. California Building Code.

D. CCR Title 24 and American with Disabilities Act (ADA).

E. National Association of Architectural Metal Manufacturers (NAAMM) - Metal Finishes Manual.

1.3 SUBMITTALS

A. Procedure in accordance with Section 01 33 00 - Submittal Procedures.

B. Samples:

1. Material Sample: Match existing signage to style, material, color and finish.

2. Full Size Patterns and Lettering: Submit full size patterns for sign. Typography must be represented in exact word and letter spacing.

C. Data: Manufacturer's technical data and instructions for signs are required.

D. Shop Drawings: Large scale, dimensioned, of all signs. Include elevation and large scale details of copy and lettering layout. Show anchorage.

E. Submittals for Closeout: Signed warranty.

1.4 QUALITY ASSURANCE

A. Uniformity: For sign and graphic image process indicated, provide products of a single manufacturer.

B. Mock-Up: Provide full size mock-up for sign. Utilize the same material and installation methods in the mock-up as intended for the final work. Schedule the installation so that the mock-up may be examined, and any adjustments made, prior to commencing fabrication of the final work necessary. Replace unsatisfactory items as directed.

1.5 HANDLING

A. Pack, wrap, crate, bundle, box, bag, or otherwise package, handle, transport, and store fabricated Work as necessary to provide protection from damage.

1.6 WARRANTY

A. Signing Warranty: Submit 5 year written warranty. Effective the date of final acceptance. This shall include agreeing to repair or replace Work which has failed as a result of defects in materials or workmanship or installation. Upon notification of such defects within the warranty period, make necessary repairs or replacement at the convenience of the Owner.

PART 2 PRODUCTS

2.1 MATERIALS

A. Aluminum: Shall be suitable for ornamental, architectural work. Surface finish shall be smooth, free of extrusions marks or imperfections. Alloy shall be selected to meet the structural requirements of the specific application as well as to provide maximum acceptance of recycled post-industrial scrap.

1. Sheet: 0.125 thick sheets, minimum or as indicated. All edges and corners eased.

B. Fasteners: Anchors and other devices required to complete the Work. Same basic metal or alloy as the metal fastened, and finished to match in color and texture.

C. Aluminum Finish: Class I clear anodized finish, AA-M12C22A41 anodic coating - Class I Architectural, clear film thicker than 0.7 mil, complying with AAMA 607.1.

2.2 GENERAL SIGN FABRICATION

A. General:

1. Produce smooth, even, level sign panel surfaces, constructed to remain flat when installed within a tolerance of +1/16 inch measured diagonally from corner to corner.

2. Letter spacing shall conform to standards shown.

3. Edges of letters, numbers or symbols shall be smooth with corners sharp and true.

4. Forms shall be free of ticks, line waver, discontinuous curves and other imperfections.

5. Construct Work to eliminate burrs, cutting edges, sharp edges and corners.

6. Surfaces, which are intended to be flat, shall be without bulges, oil canning, or other physical deformities.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify conditions and measurements affecting the Work of this Section at site. Make sure that detrimental conditions are corrected before proceeding with installation.

3.2 INSTALLATION

A. General:

1. Complete installation shall be in accordance with manufacturers printed instructions and accepted shop drawings, to produce work complying with the Drawings.

2. Locate signs where shown. Install securely, level, plumb and at height indicated, with sign surfaces free from distortion and other defects.

3. Install post mounted signs using structural plates to structural concrete slab.

4. Repair damaged primer by cleaning the damaged area, sand smooth, re-clean and spot-prime with the same paint as that used for shop priming applied to a minimum thickness of 2 dry mils.

5. Repair damaged zinc coating with zinc-rich paint specified applied in multiple coats to dry film thickness of 8 mils, in accordance with ASTM A780, regardless of the width of the abrasion (not limited to 3/16 inch).

B. Pin/Stud Mounted Signs:

1. Pin/stud mounted signs, accurately drill holes using a template to accurately locate stud location and placement. Clean out dust and debris and set stud in full bed of adhesive. Use spacers at locations shown on Drawings. Copy and symbols shall be level and evenly spaced.

3.3 ADJUSTING

A. Neatly repair minor blemishes or marring on finished surfaces so that repairs are imperceptible. Completely replace components having permanent non-removable scratches, stains, or other defacement.

3.4 CLEANING/PROTECTION

A. Cleaning: Upon completion of the Work, remove unused materials, debris, containers and equipment from the project site. Remove protective coverings and clean the exposed surfaces of the Work to remove dirt, stains and other substances, by methods as recommended by manufacturer.

B. Protection: Protect the Work during the construction period so that it will be without any indication of use or damage. Leave the Work clean and free from defects at time of acceptance.

END OF SECTION

SECTION 12 36 40

STONE COUNTERTOPS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Stone countertops.

B. Related Sections: Section 05 50 00 - Metal Fabrications for steel countertop supports.

1.2 REFERENCES

A. ASTM C119-04 - Terminology Relating to Dimension Stone.

B. ASTM C170-90 (1999) - Test Method for Compressive Strength of Dimension Stone.

C. ASTM C615-03 - Specification for Granite Dimension Stone.

D. ASTM C880-98 - Test Method for Flexural Strength of Dimensional Stone.

1.3 SUBMITTALS

A. Product Data: Stone and stone accessories.

1. Stone Type: Physical properties.

B. Shop Drawings: Include plans, sections, details and attachments to other work. Show fabrication and installation details for dimension stone.

1. Include dimensions and profiles of stone unit.

2. Show locations and details of joints.

3. Show locations and details of anchors and supports.

C. Stone Samples: Two sets for each stone required, exhibiting the full range of color characteristics expected; not less than 12 inches square.

1. Grout Samples: Full range of exposed color and texture.

2. Sealant Samples: For each type and color of joint sealant required.

D. Sealant Compatibility Test Report: Submit test report from sealant manufacturer, stating that sealants will not stain stone.

E. Maintenance Data: Provide maintenance manuals for stone countertop. Include stone care products recommended by stone source.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Skilled workers who custom-fabricate stone installations similar to work of this Project.

B. Source Limitations for Stone:

1. Obtain stone from a single quarry.

2. Make stone slabs available for Architect to examine for appearance characteristics.

a. Architect will select aesthetically acceptable slabs and will indicate aesthetically unacceptable portions of slabs.

C. Mock-Up: Build mock-up to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mock-up of typical countertop as shown on Drawings

2. Approved mock-up may become part of the completed work.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify dimension of construction to receive stone countertops by field measurements before fabrications.

PART 2 PRODUCTS

2.1 STONE SOURCE

A. Varieties and Source:

1. Stone: Alpha Granite & Marble.

2.2 STONE MATERIAL

A. Granite: ASTM C615.

B. Cut stone from one block or contiguous, matched blocks in which natural markings occur.

C. Match Architect's samples.

D. Granite Type:

1. Stone Variety: Silver sea green variety by Alpha Granite & Marble.

2. Interior countertop.

3. Finish: Polished.

4. Thickness: Not less than the following:

a. 1-3/16 inches (30 mm).

2.3 STONE ACCESSORIES

A. General: Use only adhesives formulated for stone and recommended by manufacturer for the application shown on Drawings.

B. Stone Adhesive: Two-part epoxy or polyester adhesive, formulated specifically for bonding stone to stone, with an initial set time of not more than 2 hours at 70 degrees F, and with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Color: Match stone.

C. Sealant for Countertops: Manufacturer's standard sealant of characteristics indicated below that comply with applicable requirements in Division 7, Section "Joint Sealants" and will not stain the stone it is applied to.

1. Single-component, neutral-curing silicone sealant.

2. Color: As selected by Architect.

3. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. Stone Cleaner: Cleaner specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.\

E. Stone Sealer: Colorless, stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated.

2.4 STONE COUNTERTOPS

A. General: Comply with recommendations in MIA's "Dimension Stone - Design Manual."

B. Nominal Thickness: Gage backs to provide units of identical thickness.

1. 1-3/16 inches (30 mm).

C. Edge: Straight, slightly eased at top.

D. Joints: Fabricate countertops in sections for joining in field, with joints at locations shown on Drawings and as follows:

1. Joints: 1/16 inch in width.

E. Cutouts and Holes:

1. Undercounter Fixtures: Make cutouts for undercounter fixtures in shop using template or pattern furnished by manufacturer. Form cutouts to smooth, even curves.

2. Counter-Mounted Fixtures: Prepare and cut countertops in shop for counter-mounted fixtures.

3. Fittings: Drill countertops in shop for shown items.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates indicated to receive stone countertops and conditions under which stone countertops will be installed, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 PREPARATION

A. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives. Allow stone to dry before installing.

3.3 CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces; do not exceed 1/16 inch in 48 inches.

B. Variation from Level: Do not exceed 1/8 inch in 96 inches, 1/4 inch maximum.

C. Variation in Joint Width: Do not vary joint thickness more than 1/4 of nominal joint width.

D. Variation in Plane at Joints (Lipping): Do not exceed 1/64 inch difference between planes of adjacent units

E. Variation in Line of Edge at Joints (Lipping): Do not exceed 1/64 inch difference between edges of adjacent units, where edge line continues across joint.

3.4 INSTALLATION OF COUNTERTOPS

A. Install countertops over plywood subtops with full spread of water-cleanable epoxy adhesive.

B. Do not cut stone in field. If stone countertop requires additional fabrication, return to fabrication shop for adjustment.

C. Set stone to comply with requirements shown on Drawings and Shop Drawings. Shim and adjust stone to location shown. Install countertops with uniform joints of widths shown and with edges and faces aligned.

D. Bond joints with stone adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

E. Space joints with 1/16 inch gap for filling with sealant. Use temporary shims to ensure uniform spacing.

F. Apply sealant to joints; comply with Division 7, Section "Joint Sealants." Remove temporary shims before applying sealant.

3.5 ADJUSTING AND CLEANING

A. In-Progress Cleaning: Clean countertops as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.

B. Remove and replace stone countertops of the following description.

1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.

2. Defective countertops.

3. Interior stone countertops and joints not matching samples and mock-ups.

4. Interior stone countertops not complying with other requirements indicated.

C. Replace in a manner that results in stone countertops matching approved samples and mock-ups, complying with other requirements, and showing no evidence of replacement.

D. Following installation and after sealants are cured, clean stone countertops using clean water and soft rags.

E. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's instructions.

END OF SECTION

SECTION 21 13 13

WET PIPE SPRINKLER SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Work of this Section includes everything necessary and incidental to design, provide and install a sprinkler system for the indicated area.

B. All work shall be installed in accordance with NFPA-13 and California Building and Fire Codes and with the San Jose handout titled "Fire Sprinkler Systems - Design, Installation and Plan Submittal Requirements."

C. Sprinkler systems shall be sized and spaced in accordance with NFPA #13.

D. All fire protection system components shall be UL listed and FM approved.

1.2 QUALITY ASSURANCE

A. Design Criteria

1. This addition shall be hydraulically calculated. Calculations and plans shall be submitted to the Fire Marshal and Allianz Risk Consultants, Inc. for approval.

2. Required Densities (gpm/sq ft most remote area or as otherwise noted):

a. Sprinkler Coverage: 1/2500 and compliance with UFC and SJ Ordinance No. 25838 and 25839.

3. Reference Standards: NFPA 13, Sprinkler System Installation.

4. California Fire Code.

1.3 INSTALLER QUALIFICATIONS

A. Installer shall hold a valid California C-16 contractor's license.

B. Installer shall demonstrate satisfactory installations of comparable systems within the preceding five years, including references.

1.4 REFERENCE

A. Standards (including):

1. National Fire Protection Association - NFPA 13 "Installation of Sprinkler Systems."

2. Underwriters Laboratories, Inc. (UL).

3. Factory Mutual, Inc.

4. American National Standards Institute (ANSI) B16.22-1980 "Wrought Copper and Bronze Solder Joint Pressure Fittings."

5. American Society for Testing and Materials (ASTM):

   a. ASTM A795-1985 "Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use."

6. California Building Code Standards (CBC).

7. American Welding Society (AWS):

   a. AWS A5.8 "Specifications for Brazing Filler Metal."

   b. AWS D10.9, 1980, Level AR-3 "Standard for Qualifications of Welding Procedures and Welders for Piping and Tubing."

8. California Building Code (CBC).

9. California Fire Code.

1.5 SUBMITTALS

A. Submit evidence of installer's current California C-16 Contractor's license and list of comparable installations required by Section 1.3 herein.

B. Submit multiple copies of catalog data sheets for all materials per Section 01 33 00. Submittals shall include the following:

   1. Sprinkler head and accessories.

   2. Pipe and fittings.

   3. Hangers and supports.

C. Submit shop drawings per Section 01 33 00.

   1. Multiple copies of detailed working drawings and hydraulic calculations shall be prepared and submitted for approval before fabrication of the project. Working drawings shall be submitted in complete sets (partial submission will not be acceptable) and shall bear the Contractor's license stamp, identity of the system designer and computer program used in the calculation of hydraulic information. Sprinkler head type and location shall be approved by the Owner's Representative prior to installation. All submittal drawings and working plans shall be prepared utilizing a computer generated system compatible with the AutoCAD system.

2. Fire Marshal approval of submittals is for permission to proceed and does not authorize design, products or installation not conforming to referenced codes and standards and this specification.

3. Upon completion of the work, the Contractor shall provide reproducible As-Built Drawings to the Architect as required by Section 01 77 00 of the Project Manual. Final approvals are subject to receipt of acceptable As-Built Drawings.

4. Fire protection system shop drawings shall be submitted to the Architect who shall review them. The drawings shall have a notation indicating the shop drawings have been reviewed and that they have been found to be in general conformance with the design of the building. The installation of the sprinkler system shall not commence until the shop drawings are approved by the Fire Marshal. Drawings shall be stamp by a C-16, or a fire protection engineer, civil engineer or mechanical engineer.

D. Submittals having any content that is incomplete or unclear will be returned without review or approval.

E. Operating Instructions: Provide instruction charts describing operation and proper maintenance of system.

1.6 COORDINATION WITH WORK SPECIFIED IN OTHER DIVISIONS

A. The Contractor shall coordinate work specified in other Divisions to avoid any interference with the effectiveness of the fire protection addition. Shop drawings shall include elevations of equipment and piping specified in other Divisions to assure coordination. The fire protection system shall be coordinated with work specified in other Divisions to assure that conflicts will not arise with structural, mechanical, electrical or architectural features of the building. Any changes required by field coordination, even after the approved shop drawings, shall be provided and installed at no cost.

PART 2 PRODUCTS

2.1 PIPE AND PIPE FITTINGS

A. All interior piping arrangements shall be approved by the Fire Marshal prior to installation.

B. Piping:

1. All piping shall be ASTM A53 Schedule 40 black steel pipe, Schedule 10 steel pipe with allied ABF anti-bacterial formula 1.D. Coating or equal. See Allied CD. Threaded joints on Schedule 10 pipes are not allowed.

2. Connections and fittings shall be threaded, flanged, grooved or welded. Fittings 2-1/2 inches and smaller shall be threaded 300 lbs malleable or ductile iron.

3. Reducing fittings shall be tapered cast metal products. Where grooved couplings are used, there shall be a separate coupling for each connection to the reducing fitting.

4. Sprinkler head shall be connected to supply piping via a threaded branch outlet and by a minimum one-inch to one-half by one-half inch threaded reducing fitting.

C. Sprinkler Heads:

1. Sprinkler Heads: UL listed or Factory Mutual approved, 155° - 165°F. for all ordinary temperature classified areas.

a. Quick response sprinklers shall be used for the Office Tower.

1) Central BV4-FR.

2) Or approved equal.

2. All sprinkler heads and sprinkler head locations shall be approved by the Architect.

D. Pipe Hangers and Supports: Hangers, supports and bracing of system shall be in accordance with NFPA 13 requirements

PART 3 EXECUTION

3.1 INSTALLATION

A. General:

1. Clean pipe and fittings and keep interiors clean throughout installation. Provide caps on ends of cleaned piping.

2. Provide reducing fittings for all changes in pipe size; provide fittings for all changes in pipe direction.

3. Prepare all piping having welds for Fire Marshal inspection prior to installation.

4. On-site fire code welding permits shall be obtained from the Fire Marshal and shall be done by a currently certified welder.

5. Piping arrangement shall avoid beams, ducts, lighting fixtures, doors and similar obstructions for openings.

B. Piping Accessories and Equipment Installation:

1. Installation of Threaded Pipe and Fittings:

a. Remove all fins and burrs; apply lubricant to male threads only.

b. Apply red oxide and oil paint or Teflon tape to all exposed threads.

2. Identification Signs: Install in accordance with referenced standards.

3. Pipe Hangers: Install in accordance with referenced standards and these specifications. Retainer straps shall be used with all beam clamps.

3.2 TESTS AND MAINTENANCE

A. All tests described and referenced in these specifications shall be performed by the Contractor in the presence of the Fire Marshal and the Owner's Representative.

B. Hydrostatic Test Preparation: All piping shall be tested at 200 psi for 4 hours with the use of Bristol Recording device with no visible sign of leakage.

3.3 IDENTIFICATION

A. Provide identification of fire sprinkler system piping and equipment to meet the requirements of referenced standards and codes and in accordance with Fire Marshal instructions.

END OF SECTION

SECTION 26 00 00

ELECTRICAL

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section shall apply to all phases of Work specified and as indicated in the Contract Documents, and as required to provide for a complete installation of electrical design for the Project.

1. Provide electrical work required for the service and connection of electrically operated and controlled equipment specified in other Divisions of the Specifications.

2. Electrical power, signal, alarm and communication systems shall be complete, tested and ready for use.

3. Provide and install a smoke detector of like quality to existing smoke detector system.

B. Refer to Division 1 for addition requirements.

1.2 QUALITY ASSURANCE

A. General Requirements: Work performed under this Division shall be installed by craftsmen skilled in the trade involved, and apprentices as indicated in the General Conditions.

B. Requirements of Regulatory Agencies:

1. Codes and Ordinances: All Work shall meet the requirements of the codes as shown on the Drawings and noted within these Specifications.

2. Materials shall bear the Underwriters Laboratories, Inc. (UL) label.

C. All equipment including but not limited to the following items shall be inspected for compliance with the reviewed shop drawings and requirements of the contract documents. Contractor shall notify the Architect upon arrival of the equipment to the job site and provide all assistance for such inspection prior to the equipment installation.

1. Lighting fixtures, including controls.

2. Recessed speakers.

3. Conductors and cables.

1.3 SUBMITTALS

A. Shop Drawings and Product Data and Samples:

1. Submittals shall conform to Section 01 33 00 of the Specifications.

2. Submit to the Architect six copies of the following:

a. Manufacturer's printed instructions for operation and maintenance of electrical equipment, including replacement parts lists.

b. Service and Operating Manuals for all equipment.

3. Samples will not be returned, unless otherwise noted.

4. Submit to the Architect three copies of the following:

a. Power floor plans with all devices located circuiting shown.

b. Lighting floor plans with all devices and fixtures locating circuiting and lighting controls shown.

c. Revised panelboard schedules.

d. Voltage drop calculations.

1.4 LOCATION AND ROUTING

A. Verify dimensions and the correct location of equipment and coordinate with other trades for any requirement before proceeding with the roughing-in of connection.

B. Locations of Openings: Locate all chases, shafts and openings required for the installation of the electrical Work during framing of the structure. Do any cutting and patching required with the approval of the Architect. Cutting or drilling in any structural member is prohibited without prior written approval of the Architect.

C. Access to Equipment: Locate switches, receptacles to provide easy access for operation, repair, and maintenance.

1.5 MATERIALS STANDARDS

A. Materials and equipment shall be new.

B. All Work shall meet the requirements of the governing codes:

1. National Electrical Manufacturer's Association (NEMA).

2. American National Standards Institute (ANSI).

3. Institute of Electrical and Electronic Engineers (IEEE).

4. Institute of Cable Engineers Association (ICEA).

5. National Electrical Contractors' Association Standards for Construction (NECA).

6. Underwriters Laboratories, Inc. (UL).

7. California Code of Regulations (CCR) Title 24.

8. California State and Local Fire Marshal.

9. Instrument Society of America (ISA).

10. California Electrical Code (T-24, Part 3), latest adopted edition, (CEC).

11. National Fire Protection Association (NFPA).

12. State Industrial Accident Commission.

13. California Building Code, latest edition (CBC).

14. Occupational Safety and Health Appeals Board (OSHA).

15. City of San Jose Fire Department requirements.

16. Americans With Disabilities Act (ADA).

C. Items for similar application shall be of the same manufacturer.

D. The label of listing by UL shall appear on all materials and equipment for which standards have been established by the agency.

E. Provide the type and quantity of electrical materials and equipment necessary to complete Work and all systems in operation, tested and ready for use.

F. Provide all incidental items that belong to the Work described and which are required for complete systems.

1.6 TESTING

A. Upon completion of the Work, conduct an operating test for each system. Demonstrate all systems and equipment to operate in accordance with all requirements of the Contract Documents and to be free from all electrical and mechanical defects. Provide all systems free from short circuits and grounds.

B. Complete all tests prior to final field observation of Project, including corrective Work based on the results of the tests.

1.7 JOB CONDITIONS

A. Notify the Architect in writing of dimensional discrepancies and other conditions detrimental to proper performance of the Work.

1.8 DEFINITIONS

A. Certain terms in these Specifications or on Drawings shall be defined as follows:

1. "Provide" - Furnish and install complete and ready for service.

2. "Utility Area" - Electrical and Telecommunications Rooms

3. "Exposed" - Exposed to view after construction is completed.

4. "Architect" - Representative of the Owner.

1.9 TEMPORARY FACILITIES

A. Unless otherwise indicated on the Drawings, Contractor shall conform to the following.

1. Temporary Lighting and Power:

a. The Contractor shall provide a temporary service arranged to serve the lighting and power requirements for construction.

b. All temporary electrical work shall be installed and removed in accordance with the latest edition of California Electrical Code, Articles 305 and 230.

c. When the permanent lighting facilities have been placed in operation, temporary lights shall be removed.

2. All temporary facilities shall be removed at completion of project.

1.10 WARRANTY

A. Provide at least two years (or more as indicated elsewhere) warranty for all materials and labor for the entire electrical system.

PART 2 PRODUCTS

2.1 GENERAL

A. Use only prime quality, new materials and equipment.

B. All wiring devices such as switches, receptacles, and smoke detectors, etc., shall be of the same manufacturer (match existing).

PART 3 EXECUTION

3.1 INSTALLATION OF EQUIPMENT

A. Install electrical equipment as specified and in accordance with manufacturer's recommendations.

B. Rough-in locations for fixtures shall be determined from the unit itself or from the approved shop drawings.

C. Provide all necessary anchoring devices and supports as required.

1. Use structural supports suitable for fixtures.

2. Check dimensions of fixtures with shop drawings.

3. Do not cut or weld to building structural members.

D. Arrange for necessary openings to allow for admittance of fixtures. Where fixtures cannot be installed as structure is being erected, provide and arrange for sleeves, or other devices to allow later installation.

E. Install fixtures to permit easy access for normal maintenance.

1. Maintain easy access to switches, pullboxes, receptacles, etc.

2. Notify the Architect in writing of relocation items that interfere with access.

F. No material or device shall be shipped to site unless submittals have been approved for such, prior to shipment.

3.2 SEISMIC PROTECTION

A. The Contractor shall be responsible for the design of his own seismic restraint systems. He shall supply to the Architect details of the forces exerted by his restraints, anchorages, and other points of attachment. Seismic protection, labor, materials and design shall be included in the Contract Sum.

B. Electrical fixtures shall be installed in accordance with the following guideline:

1. California Building Code (CBC), Title 24.

3.3 CUTTING AND PATCHING

A. Field verify all openings indicated on the Drawings. Provide all cutting and patching required for electrical work.

B. Sleeves and Inserts: Provide all sleeves, inserts, and openings necessary for the installation of the Electrical Work.

C. Openings for all electrical fixtures and materials shall be field verified:

1. Special forming, recesses and chases for the correct reception and installation of the electrical fixtures as shown on the Drawings.

2. Ascertain that provisions have been made for the Work. If such provisions are not made in time, the Contractor shall bear all extra costs incurred in later cutting and patching to accommodate the work.

D. Penetrations:

1. All penetrations through fire rated walls to be sealed with fire stopping.

2. All penetrations through acoustically treated walls shall be sealed with non-hardening resilient acoustic sealant.

3.4 PROTECTION AND CLEANING

A. Protection: Fully protect all finished parts of the materials and fixtures against physical damage from whatever cause during the progress of the work and until completion.

B. During construction, cap all conduits so as to prevent the entrance of sand and dirt.

C. Cleaning: After installation has been completed, the Contractor shall clean all systems as follows:

1. Materials and Fixtures with Factory Finish: Clean exterior thoroughly to remove grease, oil, plaster, cement and dirt, and leave surfaces clean and polished.

2. Materials and Fixtures to be Painted: Clean exterior of piping and equipment exposed in completed structure, removing rust, plaster, cement and dirt by wire brushing. Remove grease, oil and similar materials by wiping with clean rags and solvents.

3.5 OPERATIONAL TESTS

A. Before acceptance tests are performed, demonstrate to the Architect that all systems and components are complete and fully operational.

END OF SECTION

SECTION 27 15 00

COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.1 DOCUMENT INCLUDES

A. The work covered under this section consists of all necessary components and labor to provide a complete, functional, certified, and standards based Data station cabling extension to an existing technology utility within the San Jose Civic Center.

B. Work scope.

C. A general criterion governing the work, materials, and workmanship required.

D. Industry references, publications, standards and definitions.

1.2 SCOPE OF WORK

A. A new voice data and communication station cabling infrastructure technology utility extension, as described in the Project Specification, and as shown in the Project Drawings, shall be installed at the San Jose Civic Center, in San Jose, California.

B. Building and Communications Cable Overview:

1. Horizontal Station cable consists of universal category-6 enhanced cable and is standardized throughout the building.

C. The scope of work is limited to the TIC located on the Tower Plaza level area and telecommunications room on the Tower Plaza level.

1. Telecommunications backbone cabling and terminations.

D. The following services shall be supported by the cabling provided under this Phase of Work:

1. Voice - As described herein to include:

a. Station outlet jacks.

b. Cross-connections.

c. Patch cords.

d. Other components as required for a complete and functional system.

2. Data - As described herein to include:

a. Station outlet jacks.

b. Patch cords.

c. Other components as required for a complete and functional system.

1.3 REFERENCES

A. To ensure conformity to the criteria described herein, the Cabling Contractor shall have access to, and adhere to at all times during the Work the most recent version (including all addenda) of Codes, Publications, Standards, Project Specifications and Guidelines governing the Telecommunications Industry including those authored by, but not limited to the following:

1. TIA/EIA (including all associated addenda published at time of contract):

a. TIA/EIA 310-D: Rack, Panels and Associated Equipment Standard.

b. TIA/EIA 455-13: FOTP-13, Visual and Mechanical Inspection of Optical Fibers, Optical Cables, Optical Connectors and other Optical Fiber Devices.

c. TIA/EIA 568-B.1: Commercial building telecommunications wiring standard Part-1 - General Requirements and all related addenda.

d. TIA/EIA 568-B.2: Commercial Building Telecommunications Wiring Standard Part-2 - Balanced twisted pair cabling standard and all related addenda.

e. EIA/TIA 606-A: Administration Standard for Telecommunication Infrastructure within Commercial Buildings and all related addenda.

f. TIA/EIA 607: Commercial Building Grounding and Bonding Requirements for Telecommunication Systems and all related addenda.

2. ANSI:

a. ANSI/ICEA S-90-661-1997: Standard for Individually Unshielded Twisted Pair Indoor Cables For Use in Communication Wiring Systems.

3. IEEE:

a. EEE 802.3: 10Base-T Ethernet Standard.

b. IEEE 802.12: 100Base-TX Ethernet Standard.

c. IEEE 802.3ab: 1000Base-T Ethernet Standard.

d. IEEE 802.3ae: 10Gb/s Ethernet Standard.

4. BICSI:

   a. Telecommunications Distribution Methods Manual (TDMM) 10th Edition.

   b. Telecommunications Cabling Installation Manual (TCIM) Latest Edition.

5. California Title 24:

   a. State Electric Code

   b. State Building Code.

6. NFPA: National Fire Protection Association.

7. NEC: National Electric Code.

8. NESC: National Electrical Safety Code.

9. FCC:

   a. Part 15: Unlicensed Radio Frequency Devices.

   b. Part 68: Terminal Equipment Certification Requirements.

B. The latest versions of all codes, standards, and guidelines shall be followed at all times. Special attention shall be paid to TIA/EIA 568B series, TIA/EIA 569 series, TIA/EIA 607, and all BICSI installation guidelines throughout the project.

C. If the year of adoption or latest revision of any code, standard or publication is omitted from any designation, it shall mean the specification, manual or test designation in effect the date the Award of Contract of the Work is given shall be utilized as the most accurate year of record.

1.4 BID SUBMITTALS

A. Procedure: In accordance with Division 1, General Requirements, and Division 2, Existing Conditions.

B. Submit a detailed list of equipment and materials to be provided for the Work specified herein and in the project drawings. This list shall be complete with part numbers and product descriptions indicating specific manufactured components. Note: All Telecommunication System components must match the Telecommunications System components of the existing system.

C. Submit manufacturer's product cut sheet documentation for the following materials and/or equipment, clearly noting each product for review:

   1. All cable types.

2. All connection blocks and patch panels (copper).

3. All technology outlet housing components (for each type of outlet).

4. All technology outlet jacks (include each type).

5. All fire stop material.

D. Submit a complete pricing for work shown and/or complete system.

1. Contractor is to itemize any miscellaneous conditions.

2. Costs are to be inclusive of a turnkey data/telecommunications utility installation based on contractor's industry experience.

E. Provide a sample twenty (20) year manufacturer's warranty of all system components that match the system components provided in the existing building telecommunication system solution.

F. Proof of Contractor's license.

G. Insurance Certificates: Amount and type of liability as required by Owner.

1.5 PRE-WORK SUBMITTALS

A. Shop drawings to be submitted prior to commencement of work described herein.

1. A proposed wiring schematic for each floor showing the main installation path-ways, any separation of station cables on floors with more than one (1) IDC, and the proposed labeling scheme for all station outlets.

2. Detailed voice and data elevation of each IDC illustrating termination locations for each termination panel for all cable types.

3. Equipment rack elevations illustrating vertical locations of termination hardware (e.g., fiber boxes, patch panels, etc.) for all distribution areas.

1.6 POST WORK SUBMITTALS

A. Performance Verification Testing:

1. A complete set of test results must be presented to the Owner either, upon completion of test verification by the Contractor. The Contractor shall identify the types of cable testers used during the testing and verification when presenting the results.

2. All verification and test results must be submitted to the Owner in both paper and electronic formats. Electronic results must be presented on CD-Rom disc(s) with

a copy of the electronic software used to generate the test results for review by the Owner.

B. As-Built Drawings and Cable List: The Contractor shall provide an "As-Built" drawing to the Owner. This as-built drawing shall include all new work described within this specification section.

C. Manufacturer's Literature:

1. The Subcontractor shall provide a complete manufacturer's product catalog for the telecommunication system components installed. This catalog shall be the latest version of the product catalog and must contain information specific for the components installed.

2. The Subcontractor shall provide a 20-year extended, manufacturer-supported warranty all components installed.

1.7 DELIVERY, STORAGE AND HANDLING

A. Procedure: In accordance with Division 1, General Requirements:

B. Deliver materials in manufacturer's unopened containers or bundles fully identified with name, brand, type and grade.

C. Store materials in a dry, well-ventilated space.

D. Comply with manufacturer's written instructions for delivery, storage, and handling requirements.

PART 2 - PRODUCTS

2.1 SUMMARY

A. The approved manufacturer of the Telecommunication System components shall match the existing building components that are installed.

B. For any product selected for installation and use by the Contractor that has measurable performance parameters, either noted below, in TIA/EIA standards, or in BICSI guidelines, the performance parameters must be verified and documented by an independent, third party testing facility, such as ETL or UL. The results of such performance verification, especially those parameter specifically noted below as exceeding TIA/EIA standards, shall be provided to the Owner for approval prior to purchase and installation of the product and/or system, by the Contractor. Any product purchased or installed by the Contractor that has not been submitted for performance verification by the Contractor is purchased and installed at the Contractor's own risk.

2.2 UNIVERSAL VOICE/DATA OUTLET JACKS AND CONNECTORS

A. Materials:

1. All modular universal voice and data outlet jacks shall be rated to exceed current TIA/EIA category 5e or 6 performance parameter and must have an eight (8) position, eight (8) conductor module that accepts both RJ45 and RJ11 modular plugs. Outlet jacks must clearly depict the T568-B pin-out wiring scheme in a permanent fashion.

2. All modular universal category 5e or 6 outlet jacks shall be provided in a color that matches the electrical trim color and shall be terminated utilizing T568B pin-out wiring scheme.

3. All category 5e or 6 outlet connectors shall exceed category-6 transmission requirements before, and after installation, for connecting hardware, as specified in ANSI/TIA/EIA 568-B Commercial Building Telecommunications Cabling Standard, Horizontal Cable Section in all noted performance parameters.

4. The category 5e or 6 universal outlet jacks shall be capable of being in a modular patching design or as a modular technology outlet supporting current 10Base-T, Token Ring, 100 Mbps TP-PMD, 155 Mbps ATM, 622 Mbps ATM using parallel transmission schemes and evolving high-speed, high-bandwidth applications, including Ethernet, 1000BASE-T, 1000BASE-TX, and 1.2 Gbps ATM.

5. The mechanical performance of the outlet jack shall have published test results indicating a minimum of 750 plug insertions and a minimum of 200 insulation displacement contact terminations over the life of the universal jack.

6. All universal outlet jacks shall be backwards compatible with all previous performance rated standards (category-3, category-5, category-5e) and shall be "center tuned" by a verifiable method from the manufacturer to category-6 test and performance specifications.

7. Permanent multicolored identification and conductor termination labels shall be part of the modular jack design to assure accurate installation.

2.3 OUTLET HOUSING

A. Materials:

1. Flush mounted faceplates in all Technology Outlet locations shall be a minimum of four (4) port plates unless otherwise noted in the Project Drawings. All flush-mounted faceplates shall be available in two (2), four (4), and six (6) outlet port configurations of the same, single gang, style. All flush-mounted faceplates shall be available in up to eight (8) outlet port configuration in a dual gang style.

2. Color of each wall-mount faceplate must match existing, coordinated with the Owner before purchase.

3. All outlet-housing faceplates shall provide a clear TIA/EIA 606-A labeling location that for both the individual outlet port and the entire outlet housing location.

2.4 CABLE

A. General:

1. All voice and data ISP cable is to be rated per the constructed conditions and verified by the Contractor prior to installation.

2. Universal, category-6 copper cable manufacturers must guarantee and warranty equal performance of their cable with multiple connectivity components. Independent verification of multi-connector solution performance must be provided, if requested, from Independent laboratory testing facility.

3. All technology cable shall be UL listed.

4. All cable manufacturing shall be ISO 9001 certified.

B. Category-6 Cable:

1. All category 5e or 6 premium performance four (4) pair cables shall consist of eight (8) twenty-four (24) gauge thermoplastic insulated solid twisted conductors that utilize the industry standard color code designations and are paired and separated by a rigid, flexible physical separator designed to minimize cross talk within a colored plenum jacket.

2. The performance criteria for the category 5e or 6 station cables shall be above and beyond the specific TIA/EIA 568B standards for the particular cable's rating and shall show stable performance out to 550 MHz. A category-6-rated cable must perform over and above each of the current specification parameters for the published category 6 rating by TIA/EIA 568B.2.

3. All premium performance category 5e or 6 UTP cable shall provide guaranteed head- room margin of four (4) dB above the minimum TIA/EIA 568B category-6 standard cross talk requirements and shall provide positive ACR to 400 MHz-km when part of a channel system.

4. Category 5e or 6 UTP, four (4) pair premium performance cables shall extend between the station location and it's associated IDC and shall terminate on eight (8) pin modular jacks provided at each technology outlet.

5. All category 5e or 6 universal cable jacketing shall comply with Article 800 NEC for use as a plenum cable and shall be composed of 100% Teflon® insulation material. Furthermore, the category-6 premium performance cable shall be rated as UL limited combustibility, in installed in a plenum environment.

6. The premium performance category 5e or 6 UTP cable shall be a fluted design with a pair isolator/separator that supports voice, analog baseband video/audio,

fax, modem, switched-56, T-1, ISDN, RS-232, RS422, RS-485, 10BASE - T Ethernet, Token Ring, 100Mbps TP-PMD, 100BASE-T Ethernet, 155 Mbps ATM, AES/EBU digital audio, 270 Mbps digital video, 622 Mbps 64-CAP ATM and emerging high-bandwidth applications, including 1 Gbps Ethernet, gigabit ATM, as well as all 77 channels (550 Mhz) of analog broadband video.

C. IDC Voice Resource Cable (Wall-To-Rack Connection):

1. The performance criteria for the multi-pair category-3 voice resource cable shall be in accordance with the specific standards for the particular cable's rating. A category-3-rated cable must perform up to, or beyond the current specification parameters for the published category-3 rating by TIA/EIA 568-B.2.

2. Category-3 copper cable used for voice resource connectivity between the racks and voice field inside each IDC shall be multi-pair UTP, twenty-four (24) AWG cable. The total pair count of each category-3 cable shall be provided as three (3) times one hundred (100) pair (totaling 300 pair) unless otherwise shown in the Project Drawings and shall meet or exceed all category-3 specifications for material and test criteria as defined by the EIA/TIA 568-B.2 specifications.

2.5 TERMINATION BLOCKS

A. Termination Blocks (Voice):

1. All wall-mounted voice field termination blocks shall be three hundred (300) or nine hundred (900) pair tower frame assemblies with 110-style insulation displacement contact type termination and connector blocks installed to terminate the voice pairs and outside plant cable at the IDC.

2.6 PATCH CORDS AND CROSS CONNECTIONS

A. General:

1. All patch cords as required to be shipped pre-assembled, verified and tested from the factory in sealed, individual packages.

2. All patch cords shall have stranded conductors that match the EIA/TIA 568-B performance characteristics of the solid conductor category-6, and category-3 cable specified above.

3. All patch cords shall utilize the EIA/TIA 568-B wiring scheme pin out.

4. All patch cords shall be manufactured by the same manufacturer that produces the outlet connectivity components to ensure mated performance; match existing.

B. Category-6 Copper Patch Cords:

1. All category-6 patch cords must utilize the T568-B wiring scheme, match existing.

2. All category-6 patch cords shall conform to the requirements of the TIA/EIA 568B standard performance parameters and shall also guarantee the headroom margin of four (4) dB above the minimum TIA/EIA 568B category-6 standard for all crosstalk requirements; and shall provide positive ACR to 400 MHz-km when part of the connectivity channel system.

3. All category-6 patch cord lengths are to be provided appropriate to patching from network equipment ports to the universal station outlet patch panels ports within the IDC and from the station outlet to the computer work surface/NIC card.

C. Category-3 Cross Connect Wire:

1. All PBX extension cross-connect wire shall be one (1) pair, Blue/White cross-connect wire.

2. All two (2) pair digital circuit cross-connect wire shall be two (2) pair, Red/Blue, Red/Orange cross-connect wire.

2.7 WIRE MANAGEMENT

A. Materials

1. All horizontal wire management on 19" relay racks shall be one (1) RU and two (2) RU panels.

2. All horizontal wire management brackets shall be molded out of flexible plastic that incorporates bend radius control surfaces at each corner and has openings between the front and rear portion of the brackets for front-to-back access.

3. Horizontal wire managers shall have a hinged cover that can be opened 180° in either the up or down position without being removed completely from the wire management bracket.

4. All vertical wire management on 19" relay racks shall be six inch (0'-6") in width.

5. Vertical wire managers shall be double sided and shall provide sufficient depth to allow for standard copper and fiber bend radii internally and when entering and/or leaving the wire management frame.

2.8 CABLE TIES

A. Materials:

1. All cable ties and all Velcro™ cable ties shall be provided where necessary as noted in TIA/EIA 568-B standards.

2. Velcro™ tie wraps are required for patch cords where installed by the Contractor to help manage installed cords.

2.9 J-HOOKS

A. Materials:

1. All J-Hooks shall be furnished in three (3) sizes allowing three (3) sizes of cable bundles.

2. All J-Hooks shall contain a minimum of one inch (1") bearing surface with rolled edges.

3. All J-Hooks shall utilize factory-made clamps, clips or other fastening devices, as required for attachment along main and/or secondary cable pathways to outlets.

2.10 FIRE STOPPING

A. Materials:

1. All fire stopping material associated with the telecommunications transport system shall comply with all applicable laws, regulations, standards, and codes and shall be re-enterable by design.

2. All fire stopping material shall re-establish the integrity of fire-rated walls, floors, ceilings, etc. when these barriers are either partially or completely been penetrated by cables, conduit, slots and other penetration elements. In many cases, fire stop penetration seals may be required to perform other safety or security functions such as environmental protection seals.

3. All fire stopping shall ensure that all floor and wall penetrations comply with the "F" and "T" ratings per proper code requirements, as noted in Division one after all work has been completed.

4. All fire stopping material shall provide fire-resistance protection using either a mechanical or non-mechanical fire stop system that consists of pre-manufactured elastomeric components shaped to fit around standard cables, tubes, and conduit.

5. If a non-mechanical fire stop system is to be used, the Contractor shall state what form will be used and state the properties of the material to be used in each specific situation, i.e., putty (with in tumescent sheet materials, ceramic fiber or rock wool fill), caulk, silicone foam, pre-manufactured "pillows", or other materials of a cement-like nature.

6. All fire stopping materials and methods shall be approved by the Owner for final approval by the authority having jurisdiction prior to purchase and installation by the Contractor.

2.11 CABLE TESTER

A. Device:

1. The utilized copper cable tester shall be a Fluke DSP 4000-Series, level-III compliant network cable-testing device certified by an independent laboratory, such as ETL or UL, for verification of high speed, category-6 TIA/EIA T568B compliant UTP cables.

2. The utilized optical fiber cable tester shall be an OTDR and optical light meter fiber cable-testing device certified by an independent laboratory, such as ETL or UL, for verification of single mode, lazer-optimzed multimode fiber and multimode optical fiber that is compliant with all associated telecommunications testing standards and guidelines (see above).

3. The Contractor shall warrant the accuracy of the testing device(s) utilized during test verification.

2.12 LABELS

A. Station Labels:

1. All station labels shall be machine-manufactured by a labeling machine. Handwritten labels will not be accepted for final labeling.

2. All station labels shall match existing.

3. All station labels shall match the Base Building Phase station labeling.

B. Cable Labels

1. All cable labels shall be machine-manufactured by a labeling machine. Handwritten labels will not be accepted for final labeling.

2. All cable labels shall match existing labeling scheme.

C. Termination Panel Labels

1. All termination panel labels shall be machine-manufactured by a labeling machine. Handwritten labels will not be accepted for final labeling.

2. All termination panel labels shall match existing labeling scheme.

PART 3 - EXECUTION

3.1 SUMMARY

A. In performing the work, adhere to all applicable professional practices, including but not limited to the standards set forth herein, governing the installation of voice and data network wiring and associated components, especially all noted EIA/TIA 568 B standards governing the work (match existing).

B. Coordinate the work with the General, Electrical Contractor and other trade contractors as may be required.

C. Complete the work as specified herein.

D. The Contractor's personnel shall be knowledgeable of the following communication practices:

1. Color coding of American telephone cables.

2. Bonding and grounding of shields.

3. Testing conductors for electrical continuity, polarity, sequence.

4. Special handling of fiber optic cable assemblies.

5. Industry Standard Cable termination methods, such as, but not limited to: 110 connector blocks, RJ jacks, and SC fiber connectors.

6. EIA/TIA 568-B.x standards for UTP and optical fiber installation and testing procedures.

7. NEXT, signal attenuation, and noise burst test procedures for UTP.

8. Power metering of fiber optic cables.

9. Industry and manufacturer's installation, testing instructions and verification documentation for all other products specified in this document.

E. Verify all installation requirements with provisions specified herein, along with those appearing in the Specifications and the Project Drawings.

F. Check actual job conditions prior to start of any work. The Contractor will be responsible for inspecting the previously performed work of other trades, and commencement of work will serve as evidence of the acceptance of this work as suitable for the work to follow.

G. The Contractor shall perform a daily cleanup of the installation site removing all debris created as a direct result of the installation of the voice data communication system.

H. Work shall conform to all OSHA, State and Owner labor requirements.

I. All work must be completed in a timely fashion following the published start and completion dates.

J. Ceiling tiles and any other miscellaneous contraction elements damaged or broken by the Contractor's Subcontractors must be replaced by the Contractor at no charge to the Owner.

K. Provide labor, tools, products, and all other necessary components to furnish and install a complete voice and data communication utility system, as described herein.

L. Coordinate construction schedule with the Owner and General Contractor before beginning installation.

M. Ensure preceding trade's work is accurate before proceeding with the installation. Examples of work which must be checked includes, but are not limited to:

1. Electrical requirements (conduit installation and capacity).

N. Stage the installation equipment in dedicated telecommunications space to avoid damage and interference with other trades.

3.2 INSTALLATION

A. All materials shall be firmly secured in place per the manufacturer's installation guidelines unless requirements of portability dictate otherwise in the Project Drawings.

B. All boxes, equipment, materials, outlet housing, etc., shall be secured plumb and square unless otherwise indicated by the project drawings and/or the manufacturer's installation instructions.

C. Protective covers normally shipped with the connector shall remain over the connector after installation. The cover shall be held in place with electrical tape or plastic tie-wraps if there is any chance of it being dislodged during construction and move-in.

D. Any connector (including all hardware) that is not normally shipped with a protective cover shall be covered with a clear non-conductive medium, such as heat-shrink or plastic wrap, to protect against dust, paint and moisture. Protective covering shall not cover cable or station identification.

3.3 VOICE DATA TECHNOLOGY JACKS AND CONNECTORS

A. Install all voice and data modular outlet jacks under the guidelines of the Manufacturers' recommended instructions and per all TIA/EIA 568B standards, BICSI guidelines, and manufacturer approved industry practices as shown in the Project Documents.

B. The installation and performance parameters of all installed voice and data modular outlet jacks shall be verified by the Trade Contractor through TIA/EIA 568B testing procedures as indicated below.

3.4 TECHNOLOGY OUTLETS

A. All technology outlets located on a wall shall be flush mounted, level and plumb. All technology outlets shall be mounted at right angles and parallel to the floor.

B. Install blank inserts in spaces within the faceplates that are not being filled with cable connection ports.

C. Mount all outlets at 18" above the finished floor, unless noted otherwise on the Project Drawings.

D. All faceplates as well as each individual utilized port must be labeled in accordance with an approved labeling scheme.

3.5 HORIZONTAL STATION CABLING

A. Install all horizontal station cabling per the manufacturer's recommended installation instructions, under the guidelines of IEA/TIA 568 B.1 and B.2 and BICSI, and in quantities indicated in the Project Drawings.

B. Install all cables with proper attention paid to bend radii, pulling method, attachment method, and pulling forces. The cable manufacturer's specifications for each particular cable type shall be followed exactly unless otherwise indicated in the Project Drawings.

C. All cable shall be visually inspected for insufficient bend radius during and after pulling. Damaged cables, or those installed under questionable methods and/or circumstances shall be replaced at no additional cost to the Owner.

D. All cable shall be pulled using an appropriate measuring device to ensure that the manufacture-specified maximum force is not exceeded as noted in BICSI guidelines.

3.6 IDC VOICE RESOURCE CABLE (WALL-TO-RACK CONNECTION)

A. Install all IDC voice resource cabling per the manufacturer's recommended installation instructions, under the guidelines of EIA/TIA 568 B.1 and B.2 and BICSI.

B. Install all cables with proper attention paid to bend radii, pulling method, attachment method, and pulling forces. The cable manufacturer's specifications for each particular cable type shall be followed exactly.

C. All cables shall be clearly labeled on both ends and in an accessible location no more than two (2) feet from the cable ends.

3.7 PATCH CORDS

A. Provide new, sealed category-6 patch cords in lengths, colors and counts approved in writing by the Owner. For bidding purposed provide two (2) category-6 copper patch cords for each technology outlet appropriate for their use at each station and in the IDC.

3.8 PATHWAYS AND CABLE SUPPORT

A. The primary cable transport system shall be the cable tray along the main corridors. Contractor installed J-hooks are to be used to supplement this system when any cabling leaves the cable tray.

3.9 CABLE MANAGEMENT

A. Install all vertical and horizontal cable management per the manufacturer's recommended installation instructions.

3.10 GROUNDING

A. All grounding and bonding shall meet the National Electrical Code (NEC) as well as local codes that specify additional grounding and/or bonding requirements.

B. Communication bonding and grounding shall be in accordance with the NEC and NFPA. Horizontal cables shall be grounded in compliance with ANSI/NFPA 70 and local requirements and practices. Horizontal equipment includes cross connect frames, patch panels and racks, active telecommunication equipment and test apparatus and equipment.

3.11 FIRE STOPPING

A. The Contractor will be responsible for all temporary and permanent supports and fire stopping, which may be required by code, the manufacturers, and/or the Owner related to telecommunication pathways and spaces.

3.12 LABELING

A. All labeling shall comply with EIA/TIA 606 standard for labeling and administration of a cable plant and shall be based on a labeling scheme provided by the Owner prior to installation. It is the responsibility of the Contractor to acquire the Owner's labeling scheme prior to final labeling.

3.13 TESTING

A. Copper Cable Testing:

1. Test all category-6, category-5e, category-3, and optical fiber cables with a third party approved Level III tester and an OTDR for IEEE and TIA/EIA 568B performance requirements, and those mentioned above.

2. The testing device must be provided by the Contractor and approved by the Owner prior to use. It is the responsibility of the Contractor to get written authorization from the Owner to commence testing with said device.

3. Contractor shall bring any cable not meeting or exceed the specified performance parameters into compliance at no charge to the Owner immediately upon failure.

4. All category-6 and category-5e cables shall comply with EIA/TIA 568-B.2 standards prior to, and after, installation along with those performance requirements noted above, and must be tested for:

a. Near End Cross Talk (NEXT)

b. PS Next

c. PS Next to 100Mhz

d. Attenuation

e. Continuity

f. Insertion Loss

g. Distance

h. Delay Skew

i. ACR (Attenuation to Cross Talk Ratio)

j. Others as may be noted in this document

3.14 TESTING DOCUMENTATION

A. A complete set of test results must be presented to the Owner either, upon completion of test verification by the Contractor, or one (1) week before the placement of active electronics in the IDC(s). The Contractor shall identify the types of cable testers used during the testing and verification when presenting the results.

B. All verification and test results must be submitted to the Owner in both paper and electronic formats. Paper results must be neatly presented in a three (3) ring binder and sectioned according to floor and cable type; category-6, category-5E, category-3, coaxial and optical fiber cables must be divided into separate sections within each floor. Electronic results must be presented on CD-Rom disc(s) with a copy of the electronic software used to generate the test results for review by the Owner.

3.15 AS BUILT DRAWINGS AND CABLE LIST

A. The Contractor shall provide the "As-Built" drawings as noted above for review and approval by the Designer and Owner

3.16 ACCEPTANCE

A. The installation will not be accepted until all work is complete and properly documented, as noted above and in the Project Drawings and not until all punch list items discovered are completed to the Owner's satisfaction and after the successful completion of the acceptance period.

END OF SECTION